

the fact that the barometer can only fall beyond the level due to the above-named differences when more air is carried away in the upper regions than comes in below. In this case the gradient is steeper at great altitudes than on the earth's surface, depending upon the strength of the up-draught, which is strongest in winter.—In the *Kleinere Mittheilungen* there is an article by Dr. Hann, on the cyclone of October 15, 1874, in Bengal, and one by Baron v. Friesenhof, on barometric maxima and minima in 1873 and 1874.

Nachrichten von der Königl. Gesellschaft der Wissenschaften, Göttingen, Nos. 22, 23, 24, 1875.—In these numbers will be found an account of some comparative experiments by M. Marmé, on the poisonous action of arsenious acid and of arsenic acid. Doses of the two acids containing equal amounts of arsenic (or with a little more in the arsenic acid dose), and diluted with water, were given to animals as similar as possible in age, weight, &c., being introduced directly into the circulation, or into the stomach, or the connective tissue. The symptoms are detailed. Without exception, the doses of arsenious acid proved more rapidly fatal than those of arsenic acid. The acid salts behaved similarly to the free acids. The fact is against Munck and Leyden's view, that arsenious acid in the blood is oxidised to arsenic acid, and that only as such it dissolves the blood-corpuscles, and causes fattening of various tissues and organs. The authors think it probable that when arsenic acid is introduced into the blood it is reduced to arsenious acid, and therefore its action appears more slowly. They further describe some experiments on the use of toxic substances to counteract arsenic acids.—M. Wöhler describes the properties of a fluorine mineral from Greenland, named "Pachnolith."—The remaining papers are mostly on chemical subjects, the principal one being by M. Hubner, on two nitro-salicylic acids and their employment in determining the nature of the hydrogen atoms in benzol.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, June 21.—Prof. P. Martin Duncan, F.R.S., president, in the chair.—Mr. Hector Maclean and Mr. Samuel Trickett were elected Fellows, and Dr. L. Rittmeyer, of Basle, a Foreign Correspondent of the Society.—The following communications were read:—1. On the Ice-fjords of North Greenland and on the formation of fjords, lakes, and cirques in Norway and Greenland, by M. A. Helland. Communicated by Prof. A. C. Ramsay, F.R.S. The author described in great detail his observations on the glacial phenomena of Greenland, and applied their results to the consideration of the traces of glacial action exhibited in Norway. His view of the course of events in Norway is as follows:—Before the Glacial epoch thousands of streams commenced the work of erosion and produced valleys. During the Glacial epoch these valleys were enlarged and lake-basins were hollowed out. The descending glaciers ground out fjords to their full length when the Glacial epoch was at its highest, but as it declined the glaciers ground out the inner part to a still greater depth, producing the present characters of the marine fjords, and giving rise to lake-hollows in other places. That the glaciers once extended beyond the fjords is shown by moraine-matter being dredged up. Some of the sea-banks and islands off Christiania-fjord are old moraines; and if Norway should be raised 400 metres, these banks would show as moraines and plains before the lake-basins of the fjords. 2. On the drift of Brazil, by Mr. C. Lloyd Morgan. The author described the position and mode of occurrence of large boulders of gneiss and granite in the red drift of Brazil and on the slopes of hills even at considerable elevations, and stated that, like Prof. Agassiz, he could not see how these could have been transported to their present positions except by the agency of ice. He is inclined to believe that the drift, if of glacial origin, was not formed by glaciers taking their rise in any of the peaks indicated by him, but by an almost universal South-American ice-sheet.—3. Recent glacial and aqueous action in Canada and the drift-uplands of the Province of Ontario, by the Rev. Wm. Bleasdel. Communicated by the President. The author described the glacial action which takes place every winter in Canada, especially on the River St. Lawrence and its large lakes.—4. The glacial climate and the Polar ice-cap, by Joseph John Murphy. The author agrees with Mr. Croll in thinking that a Glacial epoch must be one of maximum eccentricity of the earth's orbit, and that the northern and southern

hemispheres during such an epoch must be glaciated alternately; but he maintains in opposition to that writer that the glaciated hemisphere must have its *summer* in aphelion. He intends this paper to be a reply to Mr. Croll's objections to this theory as put forth in his work on "Climate and Time."—5. On the discovery of plants in the Lower Old Red Sandstone of the neighbourhood of Callander, by R. L. Jack and R. Etheridge, jun., of the Geological Survey of Scotland. The plant-remains are described as being of a very fragmentary nature. The authors discuss the relationships of these remains with other described Devonian forms, and regard them as most nearly allied to *Psilophyton princeps*, Dawson. They describe the plant with doubt as a species of *Psilophyton*.—6. On an adherent form of *Productus* and a small *Spiriferina* from the Lower Carboniferous Limestone Group of the East of Scotland, by R. Etheridge, jun., F.G.S., of the Geological Survey of Scotland. From the consideration of the characters presented by the more mature valves, the author stated that the nearest affinity of the species of *Productus* appears to be with *P. wrightii*, Dav., but that it shows peculiarities allying it to *P. longispinus*, Sow., *P. scabriculus*, Mart., and *P. undatus*, Deffr. He was not prepared to describe it as a distinct species, but suggested for it the name of *Productus completens*, in allusion to its embracing habit, in case of its proving to be distinct. The *Spiriferina* described by the author was compared by him with *S. cristata*, Schl., var. *octoplicata*, Sow., and with *S. insculpta*, Phill., from both of which it differs in certain characters; but as only one specimen has been met with, he refrained from founding a new species upon it. The specimen is from Fullarton Quarry, near Temple, Edinburghshire.—7. Notice of the occurrence of remains of a British fossil *Zeuglodon* (*Z. wanklyni*, Seeley) in the Barton Clay of the Hampshire coast, by Harry Govier Seeley, F.L.S. In this paper the author described the remains of a species of *Zeuglodon* obtained by the late Dr. A. Wanklyn from the Barton Cliff, consisting of a great part of the skull, about the same size as that of *Zeuglodon brachyspondylus*, Müller. The species, named *Z. wanklyni* in memory of its discoverer, differs from all known species of the genus in the shortness of the interspaces between the teeth.—8. On the remains of *Emys hordwellensis*, from the Lower Hordwell beds in the Hordwell Cliff, contained in the Woodwardian Museum of the University of Cambridge, by Harry Govier Seeley, F.L.S. The remains described by the author consist of some fragments constituting the greater part of the plastron and carapace of a species of *Emys*, for which he proposes for the species the name of *Emys hordwellensis*.—9. On an associated series of cervical and dorsal vertebrae of *Polyptychodon* from the Cambridge Upper Greensand in the Woodwardian Museum of the University of Cambridge, by Harry Govier Seeley, F.L.S. The author described in detail the structure of the atlas and axis and of the five succeeding (cervical) vertebrae; nine dorsal vertebrae were also described.—10. On *Crocodylus icenicus* (Seeley), a second and larger species of crocodile from the Cambridge Upper Greensand contained in the Woodwardian Museum of the University of Cambridge, by Harry Govier Seeley, F.L.S. 11. On *Macrurosaurus seminus* (Seeley), a long-tailed animal with procelous vertebrae, from the Cambridge Upper Greensand, preserved in the Woodwardian Museum of the University of Cambridge, by Harry Govier Seeley, F.L.S., F.G.S.

(To be continued.)

Geologists' Association, July 7.—Mr. William Carruthers, F.R.S., president, in the chair.—Part ii. of the geology of Brighton, by Mr. Howell.—On the British Palæozoic Arcadæ, by J. Logan Lobley, F.G.S.—It was admitted that any classification of the Lamellibranchiate fossils of the Palæozoic rocks must be liable to considerable subsequent modification since the generic position of many species on account of imperfect preservation cannot be given with certainty. American palæontologists had added largely to our knowledge of Palæozoic Arcadæ, and the recent investigations of Mr. Hicks had extended the known stratigraphical range of this family as well as of the class Lamellibranchiata. The author, objected to the retention in Arcadæ of sinuapallial genera, and proposed that these should constitute a new group, the *Ledidae*. After eliminating several of the generic names which had been employed by authors, the genera allowed to stand were separately described, and the species by which they were represented in British Palæozoic rocks enumerated. The stratigraphical distribution of these species was shown by two tables, with which the paper concluded.

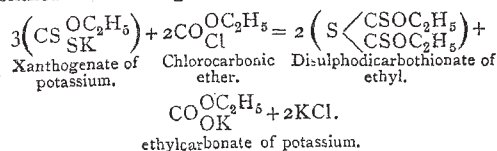
Entomological Society, July 5.—Prof. Westwood, president, in the chair.—Mr. Douglas exhibited some rare British

Psyllidæ taken by himself near Lee, Kent, amongst which was *Aphalara renosa*, Först., new to the British fauna, now first identified as living on *Achillea millefolium*.—The President showed some microscopic slides containing specimens of Diptera, &c., prepared with extraordinary care by Mr. Enock. He also brought for exhibition twigs of horse-chestnut from Oxford, that had been attacked by some kind of larva, which had eaten away the inside of portions of the stem, causing the buds to drop off. He was in doubt whether the insect was *Zemera Aesculi*, or some other, but he would be glad to know if the destruction to the trees had been noticed elsewhere. He also exhibited two species of Coccus, one of them on Camellia leaves in his greenhouse which he had previously described in the *Gardener's Chronicle* under the name of *C. Camellia*, and which had afterwards been observed by Dr. Verloren in his greenhouse in Holland. The female, which is 1 line in length, discharges a white waxy matter having the appearance of the excrement of a young bird. The other species had been sent to him by the Rev. T. A. Preston, of Marlborough, on a species of Euphorbia obtained from Dr. Hooker, of Kew. The leaves were covered with small scales, to which on close examination he observed two small filaments attached; and these proved to be the caudal extremities of the males. These insects emerge from the pupa backwards, and in consequence they make their appearance with the wings drawn forwards over the head.—Mr. Stevens exhibited varieties of some British Geometræ and what appeared to be a small variety of *Lycaena adoni*, taken near Croydon.—Mr. Baly communicated descriptions of a new genus and of new species of Horticinæ; and Mr. Peter Cameron communicated descriptions of new genera and species of Tenthredinidæ and Siricidæ, chiefly from the East Indies, in the collection of the British Museum.—Part II. of the *Transactions* for 1876 was on the table.

BERLIN

German Chemical Society, June 26.—H. Vohl proved that inosite by fermentation yields ordinary, and not paralactic acid.—W. Möslinger has obtained several octyl-compounds from octylic alcohol (derived from the seed of *Heracleum spondylium*), viz., octylene, iodide of octyl, octylic and octyl-ethylic ether, octyl-sulphate of barium and mono-octyl phosphine.—H. Brunner and R. Brandenburg have found succinic acid in sour grapes.—E. Klimenko, by treating lactic acid with bromal, has obtained lactid-bromal $C_6H_5Br_3O_3$ identical with the product obtained by acting with bromine on lactic acid.—H. Willgerot has replaced chlorine in dinitro-chlorobenzol by NH_2 , by SH and by the residues of aniline and of benzidine.—L. Barth and H. Sennhofer, by treating C_6H_5CN benzonitril with a mixture of oil of vitriol and phosphoric anhydride and afterwards with water, have transformed it into crystals of dibenzamide $(C_7H_5O)_2NH$, the hydrogen of which can be replaced by different metals.—The same chemists have obtained the third isomeric or meta-phenol-sulphurous acid by fusing benzol-disulphurous acid with potash, and interrupting the fusion before both groups SO_3H have been replaced by OK. The result is a potash salt soluble in alcohol— $C_6H_5OK.SO_3K$.—A. Fleischer, in treating diphenyl sulphurea with fuming nitric acid, has obtained tetranitroazoxybenzol— $C_{12}H_8(NO_2)_4N_2O$.—The same chemist described springs containing free sulphuric acid which occur in caverns of the Budos Mountain in Hungary.

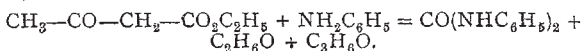
July 10.—A. W. Hofmann, president, in the chair.—F. Krafft has transformed iodide of hexyl $C_6H_{13}I$ into perchlorobenzole C_6Cl_6 by treating it with chloride of iodine. The same chemist, conjointly with F. Becker, described the formation of two isomeric dichloro-naphthalenes, which, according to these experiments, is always preceded by the formation of an addition-product $C_{10}H_8Cl_4$.—V. Merz has transformed a number of aromatic substances into C_6Cl_6 by treatment with ICl_3 .—Th. Zöller communicated further researches on the preserving properties of bisulphuret of carbon, and its application for preserving meat, fruit, and vegetables.—E. de Souza described amalgams of the formulæ Na_3Hg , K_3Hg , Au_3Hg , Au_5Hg , $Ag_{10}Hg$, $Ag_{11}Hg$, Ag_4Hg , $Cu_{16}Hg$, $Cu_{14}Hg$, Pb_3Hg .—H. Welde has established the following reaction:—



Disulphodicarbonate of ethyl forms splendid yellow needles.—C. Böttinger has transformed pyrroacemic acid $C_3H_4O_3$ into $C_3H_5SO_2$ thiolactic acid. Dissolved in alcohol and treated with zinc pyrroacemic acid $CH_3.CO.CO_2H$, yields dimethyl-
 $CH_3-C(OH)-COOH$

tartaric acid forming well crystallised

$CH_3-C(OH)-COOH$
 salts with baryta and potassa.—W. Kelbe has treated chloride of phosphorus with mercury-dinaphthyl, obtaining $C_{10}H_7PCL_2$, which with chlorine yields $C_{10}H_7PCL_4$. The latter with water yields naphthylphosphinic acid $C_{10}H_7PO(OH)_2$.—H. Köhler and A. Michälis have dissolved sulphur in phosphenylic chloride, obtaining phosphenylic sulphochloride $C_6H_5PSCl_2$, an oily liquid yielding diatomic ethers with alcohol and phenol.—C. Liebermann showed specimens of Mr. Rosenstiehl's nitro-alizarine and of cotton dyed with this new colouring-matter; its alumina lake is of a deep orange tint.—A. Oppenheim and H. Precht described the following derivatives of dehydracetic acid: a soluble silver-salt, $C_8H_7AgO_4$, its methylic and ethylic ethers fusing at $90^{\circ}8$ and $91^{\circ}6$ respectively; its amide, $C_8H_7O_3NH_2$, fusing at $208^{\circ}5$; its anilide, $C_8H_7O_3NHC_6H_5$, fusing at 115° ; monobromodehydracetic and monochlorodehydracetic acids fusing at 134° and 93° respectively. With PCl_5 dehydracetic acid forms the chloride, $C_8H_5O_2Cl_2$, which, heated with water to 180° , regenerates dehydracetic acid. Hydrogen in statu nascendi does not simply unite, but replaces the oxygen of the acid, forming a compound which will form the subject of further investigations.—The same chemists have found that aceto-acetic ether and aniline form alcohol, acetone and diphenyl-urea—



—O. Emmerling and A. Oppenheim subjected the same ether to oxidation with permanganate of potassium, which divides its molecule into oxalic and acetic ethers. The same chemists have prepared aceto-acetate of isobutyl, $CH_3.CO.CH.COOC_2H_5$, boiling at 203° . As this substance by distillation yields dehydracetic acid, while with sodium and chloroform it yields oxyvitic acid, it is fully proved that neither ethyl nor any other alcoholic radical enters into the formation of these acids, which are equally well produced by all aceto-acetic ethers.—Oxyvitic acid, $C_8H_5(OH)(CH_3)(CO_2H)_2$, has been submitted by the same chemists to the action of nitric acid, which, when diluted, yields hydro-oxybenzoic acid, $C_7H_5O_3$; when concentrated, and particularly when mixed with sulphuric acid, it yields trinitrocresol, $C_6H(OH)(CH_3)(NO_2)_3$, fusing at 106° . With sulphuretted hydrogen, its alcoholic solution yields dinitro-amido-cresol, $C_6H(OH)(CH_3)(NO_2)_2NH_2$, brilliant dark yellow needles, fusing at 156° . With nitrous acid this substance is transformed into dinitro-diazo-dinitro-amido-cresol—

$C_6H(OH)(CH_3)(NO)_2 - N = N - NH.C_6H(OH)(CH_3)(NO)_2$, yellow scales, which at 160° decompose with explosive violence.

—H. Wichelhaus has studied the action of naphthylamine on nitro-naphthaline, which may be expressed by the equation— $C_{10}H_7NO_2 + 2C_{10}H_7NH_2 = (C_{10}H_6)_2N_2 + NH_3 + H_2O$. The resulting diamine corresponds to violaniline. The same chemist has tried in vain to repeat the synthesis of indigo published by Emmerling and Engler, 120 experiments in test tubes yielding sublimes consisting of zinc and cadmium only.—W. Hill has prepared methylated allantoin, and transformed methylated uric acid into methylated parabanic acid.—T. Murdoch, by heating alloxantin, has transformed it into hydrylic acid.

PARIS

Academy of Sciences, July 10.—Vice-Admiral Paris in the chair.—The following papers were read:—Theorems relating to couples of rectilinear segments having a constant ratio, by M. Chasles.—Philosophy and teaching of mathematics; on the reduction of demonstrations to their most simple and direct form, by M. de Saint-Venant.—On a communication of M. Sacc, entitled "Panification in the United States, and the Properties of Hops as Ferment," by M. Pasteur. He asserts (contrary to M. Sacc), that hop has no influence in raising the dough, and it does not contain a soluble alcoholic ferment. The dough rises because of the development of microscopic organisms; hop may favour or hinder the production of some of these. It gives bread a slight bitterness, which is often liked.—On the carpallary theory according to the Amaryllidæ (fourth part, Narcissus), by

M. Trecul.—Note on the "Study of the Hurricanes of the Southern Hemisphere" of Commandant Bridet (third edition), by M. Faye. The work contains many curious observations on cyclones, but its advocacy of centripetal aspiration is condemned. —New remarks on the question of displacement of spectral lines due to proper motion of the stars, by P. Secchi. —Objections to the last communication of M. Hirn, on the maximum of possible repulsive pressure of the solar rays, by M. Ledieu. —Examination of new methods proposed for finding the position of a ship at sea (continued), by M. Ledieu. —Pliocene man, by M. de Quatrefages. This refers to an Italian work on "Pliocene Man in Tuscany," by M. Capellini. —M. de Lesseps presented a summary report from M. Roudaire on the results of his mission to the isthmus of Gabes and the Tunisian Chotts. These labours have been quite successful, and prove the possibility (M. de Lesseps thinks) of forming an internal lake of 25 to 40 metres in depth, and 400 kilometres in length from east to west, having its entrance at the Gulf of Gabés, and covering a space of about 16,000 square kilometres. —M. Tisserand reported on observations made at Kompira-Yama (near Nagasaki, Japan), during his transit-mission. —M. Favé was elected free member in place of the late M. Seguer. —Experimental researches on magnetic rotatory polarisation (third part). Dispersion of the planes of polarisation of luminous rays of different wave-length, by M. Henri Becquerel. The positive rotations of diamagnetic bodies in rease approximately in inverse ratio of the squares of the wave-lengths, the negative rotations of magnetic bodies in inverse ratio of the fourth power of the wave-lengths. —On cellulosic fermentation of cane-sugar, by M. Durin. Cane-sugar is decomposed into equivalent weights of cellulose and coulose, under the influence of a special ferment, which is of diastotic nature. —On the aerial Phylloxera, by M. Boiteau. —On the development of elliptic functions and their powers, by M. André. —Experiments of measurement of velocity (of water in canals) made at Roorke, in British India, by Mr. Allan Cunningham, by M. Bazin. —On the difference of potential in the insulated extremities of an open induction bobbin after rupture of the inducing current, by M. Mouton. He seeks to measure the successive values of these differences of tension, and establish some laws of their variations. —On the reactions of chlorine under the influence of porous carbon, by M. Melsens. A reclamation of priority. —On a new butylic glycol (continued), by M. Milan-Nevala. —Explanation of the impression ability of the black faces of a radiometer by means of the theory of emission, by M. Biot; note by M. de Fonvielle. —On the crystallisation of sugar, by M. Flourens. —Anatomical characters of the blood in the anæmic (continued), by M. Hayem. —Influence of fatigue on the variations of the electric state of muscles during artificial tetanus, by MM. Morat and Toussaint. —On a remarkable case of reduction of nitric acid and oxidation of acetic acid, with production of alcohol, under the influence of certain microzymes, by M. Bechamp. —Influence of physico-chemical forces on the phenomena of fermentation, by Dr. Bastian. —On a new meteorite that fell on March 25, 1865, at Wisconsin, and whose character is identical with that of the meteorite of Meno, by Mr. Smith. —History of natural wells, by M. Meunier. —Mineralogical notices, by M. Pisani.

July 17.—Vice-Admiral Paris in the chair. —The following papers were read: —On the fermentation of fruits, and on the diffusion of germs of alcoholic yeast, by M. Pasteur. —On M. Durin's note concerning cellulosic fermentation of cane-sugar, by M. Pasteur. —On the alteration of urine, *à propos* of a note by Dr. Bastian, by M. Pasteur. The facts do not prove spontaneous generation, but only that certain germs resist a temperature of 100° in neutral or slightly alkaline media, their envelopes, doubtless, not being penetrated in this case by the water. —On the intercellular generation of alcoholic ferment, by M. Frémy. Fruits placed in an atmosphere of CO₂ or H undergo alcoholic fermentation, and an organic ferment is generated which may cause fermentation of sugar. —Fourth note on electric transmissions through the ground, by M. du Moncel. He compares the currents got from couples made with silex of Heronville and electrodes of zinc, platinum, &c., with those of a Daniell. —Examination of new methods for finding the position of a ship at sea (continued), by M. Ledieu. —On the measurement of the electric resistance of liquids by means of the capillary electrometer, by M. Lippmann. One special advantage of this method is that the sensibility does not diminish even when the resistance increases indefinitely. The method is independent of polarisation of electrodes. —On a rock of vegetable origin, by MM. Bureau and Poisson. This was found by M. de l'Isle on the bottom of a grotto in the Island of Réunion;

it seemed entirely made up of spores or grains of pollen, probably spores of Polypodæ. —On the transformation of saccharose into reducing sugar, in the operations of refining, by M. Girard. —Detection and determination of fuchsin and arsenic in wines artificially coloured with fuchsin, by M. Husson. —On a new compensator pendulum, by Mr. Smith. He utilises the dilatibility of vulcanite. —On three sand boxes on the savane of Fort-de-France, Martinique, by M. Berenger-Feraud. —On the parthenogenesis of Phylloxera compared with that of other pucerons, by M. Balbiani. —Results obtained at Cognac with sulphocarbonates of sodium and of barium applied to phylloxerised vines, by M. Mouillefert. —Results obtained in using iron pyrites against oidium, by M. François. —Discovery and observation of Planet 164 at Paris observatory, by MM. Henry. —Observations of the same planet at Marseilles, by M. Stephan. —On the circumstances of production of two varieties of sulphur, prismatic and octahedric, by M. Gernez. —Critical researches on certain methods employed for determination of the densities of vapour, and consequences that are drawn from them; by MM. Troost and Hautefeuille. —Action of hydracids on selenious acid, by M. Ditte. —Observations on iodine as reagent for starch, by M. Puchot. Its sensibility is at fault in presence of certain azotised organic matter, such as albumen. —On rhodine, a new reaction of aniline, by M. Jacquemin. —Study of the action of water on glycols, by M. Milan-Nevala. —On the existence, in Spain, of a bed of nickel ores similar to those of New Caledonia, by M. Meissonnier. This is in Malaga. The first works of exploration recently commenced, have furnished several hundreds of tons. —Anatomical characters of blood in the anæmic; third note by M. Hayem. The weakening of colour and the failure of agreement between this colouring power and the number of coloured elements are the two essential characters of anæmia. —On some phenomena produced by faradisation of the grey matter of the brain, by M. Bochefontaine. If it be admitted that there are motor centres of the limbs in the grey substance, yet the same stimulation (which causes limb-motion) puts in action the muscles of organic life and the glands. But the facts do not prove the cortical substance excitable by faradic currents; the stimulation probably affects the subjacent white matter. —Cutaneous respiration of frogs with regard to the influence of light, by M. Tubini. Frogs deprived of their lungs excrete CO₂ in darkness and in light, in quantities having the proportion 100:134. —On disease of the ox through the inermous tænia of man, by MM. Masse and Pourquier. The rabbit, dog, and sheep are not a favourable soil for development of this tænia, but the ox is. —On vesical microzymes as cause of the ammoniacal fermentation of urine, by M. Bechamp. —On meteoric iron, by M. Yung. —On a vertical column seen above the sun, by M. Penou. —On traces of the presence of man in grottoes in various parts of Provence, by M. Jaubert.

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